NERC HEALTH & SAFETY PROCEDURE NUMBER: 20

WORK RELATED ACCIDENT, INCIDENT, ILL HEALTH AND NEAR MISS REPORTING AND INVESTIGATION

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INTRODUCTION

"If you think safety is expensive, try an accident" – Chairman of Easy Group.

On average over the past five years more than 200 workers died every year in mainland and offshore oil and gas workplaces in the United Kingdom as a result of an accident at work. For each worker who dies, about 170 suffer major injuries and over 600 suffer an injury leading to them taking more than 3 days off work (2009/2010 stats). The numbers of persons suffering lost time and death arising from ill health directly attributable to work-related causes is even higher. Over 2000 persons die in the UK each year from mesothelioma arising from exposure to asbestos, most of which is work related, and this number has yet to peak due to the considerable lag period between exposure and onset of the disease. During the course of a year 40 million working days are lost through work related accidents and illnesses. It is of great benefit to effective safety management if everyone affected by our work activities reports relevant work related accidents, ill health, incidents and near misses. This enables occurrences to be investigated, causes determined and lessons learnt so that actions can be taken to reduce the numbers of future preventable work related injuries and ill health to a minimum.

The investigation and analysis of work related accidents, ill health, incidents and near misses forms a critical element in improving management of health and safety. A thorough and well-conducted investigation will provide a deeper understanding of the risks associated with work activities and enable effective, well thought-out risk control measures to be put in place. Only by prompt reporting of work related accidents, ill health, incidents and near misses can this occur.

SCOPE

This procedure covers:

- **Reporting work related accidents, ill health, incidents and near misses in the local reporting system**
- **Reporting to the relevant enforcing authority when required**
- **Investigating any work related accidents, ill health, incidents and near misses that are reported to an enforcing authority or which have serious implications**
- **Modifying procedures or safe systems of work if the investigation shows this is necessary**

You must report work related accidents, ill health, incidents and near misses to the local accident reporting system

CONTENTS

DEFINITIONS

- **RIDDOR** – the **Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013.** These apply to all work activities in Great Britain and to the offshore oil and gas industries and require reporting to the **Health and Safety Executive (HSE)**. An equivalent set of regulations with very similar requirements applies to ships and requires reporting to the **Marine Accident Investigation Branch (MAIB)**, namely the **Merchant Shipping (Accident Reporting and Investigation) Regulations 2012**. For aircraft there are also reporting requirements under **The Civil Aviation (Investigation of Accidents and Incidents) Regulations 1996** which require reporting to the **Air Accident Investigation Bureau (AAIB)**, although these are somewhat different in nature and application, and the **Mandatory Occurrence Reporting (MOR)** scheme operated by the **Civil Aviation Authority (CAA)**
- An accident is often defined as "an unforeseen event" but this is not particularly helpful in the context of health and safety. A more refined definition is useful so that a common approach across NERC can be established. NERC uses the following definitions for an **accident, incident and near miss** arising out of or in connection with its work activity:
    - **Accident** – an unplanned, unpremeditated event caused by unsafe acts or conditions resulting in injury.
    - **Incident** – an event causing actual damage to property (including plant or equipment) or other loss with potential to cause injury.
    - **Near Miss -** an unplanned event with the potential to cause injury or loss.
- **Specified injury** – this is a reportable serious injury as defined by RIDDOR. They were formerly called major injuries but the definitions of the categories of injuries to be reported have been changed.
- **Reportable Lost time injury**– this is reportable under RIDDOR (or other legislation such as for ships) where the person affected is off work or unfit to carry out their normal work as a result of a work related accident for more than seven consecutive days (more than three consecutive days on ships).
- **4-7 day lost time injury** (incapacitation for work) – no longer reportable under RIDDOR but a record must be kept and the Safety Advisor informed.
- **Lost time injury** – where a person is unable to come to work the day (although sometimes after a delay of several days) following a workplace injury as a result of a work-related accident (details required for annual reporting requirements)
- **Dangerous Occurrence** – a serious reportable incident as defined RIDDOR.
- **Reportable disease** – one of the listed occupational diseases as defined under RIDDOR.
- **Work related ill health** – where a person suffers illness, or an existing condition is made significantly worse, directly as a result of a work related activity. Often ill health is multi-causal and in such cases it should only be considered work-related where the contribution of the work activity to its causation is deemed to be 50% or more.
- **Lost time work related ill health** – where work related ill health results in one or more days off work.
- **Risk** – the level of risk is determined from a combination of the likelihood of a specific accident, incident or near miss occurring and the severity of the consequences.
- **Risk Control Measures** – these are the workplace precautions put in place to reduce the risk to an acceptable level.

ACCIDENT REPORTING

NERC requires staff to report work related accidents, ill health, incidents and near misses. Some NERC sites may still use the HSE BI 510 accident book (ISBN 0-7176-2603-2) for this purpose; it combines the requirements of social security and health and safety regulations. This book is one method of recording injuries but is not wholly satisfactory since it is not designed to record work related ill health, incidents or near misses, although sites may continue to use it provided it is supplemented by other systems. Although it is mandatory to keep a record of accidents, there is no single prescribed method that must be used. An electronic online accident, incident and near miss reporting system is available and should be used where possible. However, a paper based accident, incident and near miss recording system may still be required on occasions and a suggested format with headings for information that needs to be recorded and with sections for investigation and NERC classifications to allow for ease of reporting corporate NERC statistics is attached at Appendix III.

It is accepted that when requiring staff to report work related accidents, ill health, incidents and near misses to be reported there is a threshold below which the effort of recording the event is not worth the value of the information recorded. As a guide, all injuries requiring first aid or more serious treatment and all incidents and near misses that have the potential to cause significant loss, serious injury, lost time or ill health must be reported. Alternative methods may be employed to record more frequent incidents or near misses, which may not have the potential to cause serious, damage but nevertheless could cause harm or loss. This could include local accident books or event logs, which if used must be regularly reviewed at least monthly to identify any trends or patterns which require following up. However, if the recording system is readily available and reporting is made as easy as possible, such as is the case with electronic systems, then increased levels of reporting will be seen. Local targets should be set to increase reporting rates of incidents and near misses so that at least as many incidents and near misses as accidents are reported and investigated, and preferably more.

Under the Reporting of Injuries, Diseases & Dangerous Occurrences Regulations 2013 (RIDDOR), which applies to land based or offshore oil and gas activities in the UK, NERC is required to report fatalities, specified injuries, over 7-day lost time injuries, injuries to non-workers (where taken from a place of work to hospital for treatment), cases of cancer, any disease / acute illness caused by exposure to a biological agent, reportable diseases, reportable dangerous occurrences that arise out of or in connection with a work activity (ie are occupational related) to the Health & Safety Executive (HSE). There is no longer a requirement to report over three-day injuries to the HSE as under the old RIDDOR but there is a requirement to keep a record of injuries leading to between 4 and 7 days off work.. The deadline by which over seven-day injuries must be reported to the HSE is fifteen days from the day of the accident.

Reporting occurrences to the HSE under RIDDOR should normally be done by a local Safety Advisor or by NERC Corporate Health and Safety. Only in exceptional circumstances should it be done by senior managers and then only after consulting a NERC safety professional. All reporting under RIDDOR should now be done electronically on-line via the internet using the appropriate form from www.hse.gov.uk/riddor. Technically RIDDOR requires that for injuries, fatalities and dangerous occurrences the HSE must be informed by the 'quickest practicable means without delay' with a report sent 'in an approved manner' within 10 days. For a disease, a report of the diagnosis must be sent in an approved manner without delay. For cases arising from carcinogens, mutagens and biological agents, the HSE must be notified in an approved manner. The HSE now indicate that phone reporting may only be done for fatalities and specified injuries. Appendix I summarises what needs to be reported under RIDDOR to the enforcing authority.

Work related accidents, ill health, incidents and near misses which occur on NERC ships must be reported under separate arrangements set out in current shipping legislation and 'M' notices to the employer and where appropriate to the MAIB. Ships over 400 gross tonnes must also comply with the requirements for reporting occurrences as laid down by the International Code for the Safe Operation and Management of Ships (ISM Code 2010).

Work related accidents, ill health, incidents and near misses which occur on NERC aircraft must be reported to the employer and where appropriate to the relevant authority – CAA / AAIB or subsidiary such as Air Safety Support International (ASSI). Work related accidents, ill health, incidents and near misses which occur to NERC staff whilst working abroad and which would have been reportable under RIDDOR had they occurred in the UK should be reported through the local reporting systems. However, there is not a requirement to report such 'RIDDOR-like' events to the HSE.

INVESTIGATION

An effective investigation should include a methodical approach to gathering and analysing information. The results of the investigation will form the basis of an action plan to prevent the accident, incident or near miss from re-occurring and for improving the overall management of risk.

The reporting and investigation system should ensure the following are established:

Where, When, Who, What, How and Why

After all relevant staff have been involved, consulted and contributed their views, recommended conclusions and any remedial actions required, may be decided. The level of investigation should base itself on the severity of the likely and foreseeable outcome of the event rather than the actual or worst conceivable outcome. For example, just because no one was seriously injured does not mean that the event did not have serious implications requiring important actions so as to prevent a recurrence. Conversely, treating all events as if they were potentially fatal should be avoided if possible. The possible occurrence of low likelihood but extreme consequence events must be considered as these may have catastrophic effects even though they only occur very rarely and not just ignored 'because they have never happened before' and 'lightning never strikes', because sometimes it may.

The aim of the investigation should be not just to understand the 'immediate' causes, eg what inflicted the injury, but also to dig deeper and identify the 'underlying' causes, eg what led to the occurrence, and what organisational or personal factors may have been involved. Such an investigation technique is sometimes called 'root cause analysis'. This will then lead to a remedial action plan being identified with 'corrective and preventive actions' assigned to a person to deal with and dates being set for their completion or review. At the initial stages the investigation should not seek to assign blame otherwise the investigation could become seriously inhibited. Ideally blame should not be placed at all unless this is the inevitable conclusion reached by all parties at the conclusion of the investigation.

Sometimes it is preferable to separate the work related accident, ill health, incident or near miss investigation report into factual / non-controversial self-evident aspects with controversial, discussion/opinion related aspects dealt with separately. The latter is not fact whereas the former should be agreed by all parties and can be more widely disseminated eg to safety representatives.

In NERC all work related accidents, ill health, incidents and near misses recorded in the local reporting system should be investigated or at least acknowledged with a comment/signature by the relevant manager and safety advisor. Informal investigation will be sufficient for minor accident, incidents and near misses. Serious work related accidents, ill health, incidents and near misses, including all those reported to enforcing authorities (see Appendix I), should be subject to a more thorough investigation

Up to 90% of all accidents can be attributable to some degree to human error or failure although this is not to imply that the individual is almost always at fault. It is recognised that the cause of an accident, incident or near miss can be more than a simple error on behalf of an individual. The HSE publication HSG48 on 'Reducing Error and Influencing Behaviour' accepts that errors and mistakes can be the result of a number of different factors such as environmental, organisational, and job. Identifying these contributory factors can be a useful part of the investigation process.

Typically an accident, incident and near miss investigation will establish the "Where, When, Who, What and How" relatively quickly. These are very often recognised as immediate causes. It can take more in-depth investigating in order to establish "Why" which very often is related to the underlying causes leading to an accident, incident or near miss. If human error or human mistake is implicated it is also important to establish why the error or mistake occurred.

It is important that the three required elements of an investigation, which can be likened to a 'tripod' with each element representing a leg, are kept balanced so the investigation (or tripod) does not become imbalanced and collapse. The three elements are: **Reporting / Evidence Collection / Analysis of facts and evidence** (leading to actions).

More information about human factors and their relevance to accident investigation is given at Appendices IV and V.

OPERATIONAL PROCEDURE

Management involvement

Management is responsible for ensuring that:

- work related accidents, ill health, incidents and near misses are recorded on the local accident reporting system
- the accident reporting system is monitored regularly
- work related accidents, ill health, incidents and near misses which have the potential or are likely to fall within the scope of the RIDDOR Regulations are brought to the attention of the local safety advisor and reported to the HSE as necessary
- accident, incidents and near misses reportable to HSE, and other work related accidents, ill health, incidents and near misses with serious implications, are investigated
- recommendations arising from investigation reports are acted on with dates for completion assigned.

Availability of BI 510 accident books

Where the BI 510 book is used as the means of recording injuries, keep accident books where they are easily available to staff. Staff will normally record injuries themselves unless they are incapacitated, in which case a colleague or manager must make the record. Once the information has been entered into the book, to comply with the Data Protection Act this page should be removed and passed to the appropriate person/department that looks after these records. These books must be supplemented by some other means of reporting, recording and investigating work related ill health, incidents and near misses.

Paper based Work Related Accident, Ill Health, Incident and Near Miss reporting System

Appendix II gives headings that may be used as a basis for work related accident, ill health and incident or near miss reporting, recording and investigation system, that may be used as a checklist for sites which do not have an electronic based system (or where the use of an electronic based system is not practical). It incorporates the NERC classification system for type of accident; type and location of injury; type of illness and type of incident/near miss which forms the basis of NERC corporate statistics.

On-line Work Related Accident, Ill Health, Incident and Near Miss reporting System

There is an iShare-based on-line reporting system that can be used throughout NERC and its closely related centres. The Accident Book or a paper based reporting and investigation system will still be available for those who do not have access to an electronic system.

Statistical returns to Swindon Office

Sites/centres must report annual work related accident, ill health, incident and near miss statistics (using the classifications incorporated in Appendix II) to Corporate Health and Safety as soon as possible and within one month after year end at the latest. Quarterly statistics (up to end of March, June, September and December) should also be reported to Corporate NERC Health and Safety at Swindon. It is recommended that Research Centres and sites should carry out monitoring to identify trends. The information is needed in order to:

- compile returns and statistics for the NERC Safety Committee, Audit Committee and Annual Report.
- enable the NERC Safety Adviser to monitor trends
- enable Research Centre Directors to take remedial action.

Summary data is required on:

- All accidents, incidents, near misses and work related ill health

Detailed information is required on:

- All RIDDOR reportable events
- All MAIB reportable events
- All over three-day lost time accidents
- All lost time accidents
- All work related ill health cases leading to lost time
- RIDDOR-like events (ie those which would have been RIDDOR reportable had they occurred in the UK)
- All AAIB reportable events
- All CAA Mandatory Occurrence Reporting events
- Other events with serious actual or potential loss

which should be reported (together with copies of notifications as appropriate) to Corporate Health and Safety as soon as possible after they occur *(note: these are reported to NERC Executive Board)*.

Non health and safety events

Work related Accident, Ill health, Incident and Near Miss reporting systems may also be used to record non-health and safety events such as those with actual / potential environmental consequences or actual/potential security events but these should be kept separate from any reported health and safety statistics.

Monitoring of accident reports

The relevant nominated person(s) should check the accident reports regularly (ideally weekly) to ensure that:

- remedial action has been taken where necessary
- RIDDORs are reported to HSE
- RIDDORs and other serious work related accidents, ill health, incidents and near misses are investigated.

Circulation of details

There is a legal requirement under the Safety Representatives and Safety Committees Regulations 1977 (as amended) to provide local safety representatives with basic details of all reportable incidents. With local agreement, this may be expanded to include basic details of all accidents, incidents and near misses that occur on a site. It is also good practice that managers and other persons with a direct involvement in safety are circulated with basic details of accidents. Care must be exercised that sensitive personal and possibly confidential information about health conditions or treatment is not circulated more widely than necessary. However, it is necessary that information about the broad nature / location of injuries and treatment received is given to enable a full investigation to proceed. A warning against persons who fill in the initial notification form to not provide confidential information and inform them the details they provide may be circulated more widely should be posted on notification systems.

Investigation

All reported work related accidents, ill health, incidents and near misses should be investigated, at least informally for minor events but in more detail for others using the principles set out below. All reports should be signed off by the Safety Advisor or other relevant competent person eg Radiation Protection Supervisor. For very serious events with wide health and safety or organisational implications the Research Centre Safety Director should appoint an investigation team. An investigation team would normally consist of a senior manager, a member of administrative staff to take notes and record details and the local safety adviser (or other relevant competent person including external or corporate staff) and could also include other members from outside the Research Centre such the NERC Health and Safety Advisor or an independent chair. The team should carry out site visits / inspections, interviews, collect evidence, speak to

relevant experts and produce written reports. A Union Side safety representative should be invited to be a member of any accident investigation team. The aim of the investigation should be to determine:

- the chain of events leading up to the accident (Where, When, Who, How and What)
- the immediate and underlying causes of the accident (Why, and keep asking Why if necessary to dig down further e.g. the 5 Whys – see Appendix XX)
- contributory factors which affected the seriousness of the consequences
- remedial actions to prevent a recurrence
- breaches of the law or NERC procedures
- whether NERC policies or procedures need to be amended.

At least one of the staff involved in the investigations must understand the reporting regulations, and have a working knowledge of any other regulations, which apply to the activity being carried out when the accident, incident or near miss happened.

For more serious events a written report should be produced which identifies the immediate and any underlying causes and makes recommendations for preventing a recurrence of the accident (often called 'corrective and preventive actions'), identifies who needs to take necessary actions and timescales for their implementation.

Dealing with the aftermath of a reportable accident or dangerous occurrence

The most senior manager available should deal with the emergency promptly and positively:

- take control
- call for emergency services if necessary
- take action to prevent secondary accidents
- identify sources of evidence at the scene
- prevent evidence from being tampered with or removed
- decide who should be notified, including referring to the NERC Business Continuity Framework document (successor to the Capstone document) to see if the NERC Chief Executive or NERC Chief Operating Officer must be informed

Collecting evidence for the investigation

Collect relevant information:

- look at the overall picture first
- keep an open mind and do not jump to conclusions
- find out who or what was involved
- take photographs, make drawings/plans/maps, note details etc.
- encourage witnesses to let you know if they subsequently remember anything else that may be relevant.

Gathering information

- keep a camera and other equipment listed below available in a convenient place, eg in a grab bag, so that it is always available for immediate use
- take a pen and a notebook or clipboard with paper
- have a rule or tape to take measurements as appropriate
- record details of any equipment or apparatus involved (eg make, model and serial number)
- take labels, markers, sealable plastic bags and containers to collect and identify items which need to be retained, examined, tested or used as evidence
- take photographs of the accident area
- preserve as evidence anything which appears abnormal, such as distorted pieces of machinery, foreign objects, items showing signs of spillage or leakage
- examine paper evidence such as condition reports, maps or plans, specifications for equipment, maintenance reports, suppliers' manuals, competence and training records.

Photography

At the scene of the accident, photographs can record:

- orientation of the scene
- weather conditions
- witnesses' view of the scene
- relative positions of debris
- evidence of deterioration, abuse, lack of maintenance of equipment.

Photographs can also be used later in the investigation to illustrate:

- dismantling of equipment
- the sequence of failure e.g. fatigue failures in metal
- evidence overlooked, or hidden, earlier in the investigation
- the written report.

Witnesses

- interview at the scene whenever possible
- interview witnesses separately if possible – to ensure that each is able to tell their own story without influence from others. Statements may need to be taken in very serious situations or where it is considered that recollections may be lost or altered with the passage of time but should not be taken for routine investigations
- put witnesses at their ease – you are establishing what happened not pointing a finger – and make the interview as informal and unthreatening as possible
- do not seek to assign blame
- interview witnesses separately so that they can speak freely, without embarrassment and with no influence from others, although they may request to have an independent person accompany them (which should not be refused without good reason)
- do not lead witnesses – ask open questions
- repeat questions if you are unclear about the answer and/or ask them in a different way
- use feedback at the end of the interview to ensure that you have recorded their testimony accurately.

Points for investigators to consider

More detail on what investigators need to consider is given at Appendix II "Steps to be followed in investigating accidents and incidents" which is adapted from the HSE publication HSG245. This suggests four steps:

Step 1 – gathering the information on *where, when and who* then *how and what*
Step 2 – analysing the information to identify the immediate and underlying / root causes and *what happened and why*
Step 3 - identifying suitable control measures
Step 4 – the action plan and its implementation

There is no single investigation technique recommended for use within NERC. For the majority of events a simple investigation following the four steps in Appendix II will be sufficient to establish the immediate and underlying (root) causes and suggest suitable corrective and preventive actions to prevent recurrence. Where the four steps suggest there are human factors involved, it may be wished to undertake further analysis using human factors. Appendix IV gives more details on use of human factors to supplement the initial basic investigation and Appendix V gives details of Performance Influencing Factors which may facilitate further 'human factor' analysis.

The '5 Whys' is a simple technique that can be used to aid in identification of immediate and underlying or 'root' causes and more information is given in Appendix VI.

For complex or serious events involving many strands a more thorough and detailed investigation methodology may be needed, Events and Conditional (formerly Cause) Factors Analysis (EFCA+)

is recommended as one system that may be useful. This is good for organising the data on the event; guiding the investigation; validating and confirming the true sequence of events; identifying and verifying factual findings, probable causes and contributing factors and simplifying organisation of the investigation report. It is involves displaying simple colour coded sticky post-it notes on a board in a structured manner with yellow for 'events', pink for 'conditions' and blue for 'queries' so they can easily be viewed, considered, discussed and re-organised as the investigation progresses with the ability to show gaps, allow insights and suggest new courses of enquiry. EFCA+ also lends itself to integration with other investigation techniques.

It is important to bear in mind that any tools / techniques are there to assist, they will not provide the answers in themselves; that can only be achieved by a successful investigation.

The investigation system needs to:

Identify:

- the sequence and timing of events
- the conditions / circumstances surrounding events
- the evidence for events and conditions
- identify gaps in evidence
- why events happened the way they did.
- the immediate and underlying ('root') causes

Recommend remedial actions ('corrective and preventive actions' or CAPAs):

- consider alternative methods of control
- reduce the likelihood that the event will recur
- mitigate the consequences should an event recur
- take immediate remedial action if necessary, even if it is only a holding one
- take permanent action as soon as possible
- document all your findings in a written report.
- actions should be assigned, where possible to named individuals or positions
- dates for completion or review to ensure actions have been taken or are on course should be set.

Review findings and recommendations:

- the report writer's manager and local safety adviser should review the report
- they should evaluate the quality of the report and give feedback on how it could be improved.

Monitor progress:

- periodically check that the recommended remedial actions are being progressed and that target dates will be met
- check the effectiveness of these actions
- look for trends in serious events.

Authorisation

All reports should be signed off by the safety advisor to show he or she is satisfied the event has been properly investigated, that basic and underlying causes have been identified and that suitable, appropriate action has been taken to prevent their recurrence. Any events with widespread lessons and actions which may affect groups beyond those immediately involved should be discussed and agreed at formal consultation meetings such as the local safety committee. If necessary involve Corporate Health and Safety in cases with serious or widespread implications so that lessons may be learned and senior management / other Research Centres informed. Major event investigation reports should be signed by the Research Centre Director or the senior manager with assigned responsibility for safety to show that he/she accepts its recommendations and gives their authority to them being carried out.

Record actions

When the recommendations have been carried out, the manager responsible must record on the report the date when the work was completed.

Encourage and monitor feedback

At all stages, encourage anyone involved in an event and/or investigation to give further information, correct or amplify earlier testimony or comment on the effectiveness of the measures taken to mitigate the effects of the accident, incident or near miss or prevent its recurrence.

Involve site safety committee

The committee should meet to discuss and review the findings of accidents reports with wider implications together with general statistics derived from reporting systems to review performance.

ROLES AND RESPONSIBILITIES

Director responsible for:

- ensuring that this procedure is followed
- appointing a senior manager to carry out investigations.

Head of Site/Head of Administration responsible for:

- ensuring that staff are aware of the need to report accidents
- ensuring that accident reports are checked regularly
- arrange for reportable accidents to be notified to the HSE
- participation – or nominating a member of staff to participate – in investigations.
- Monitoring trends from accident, incident and near miss reporting data

Line Managers must:

- ensure that their staff enter work related accidents, ill health, incidents and near misses onto the local accident reporting system as appropriate
- ensure that any time off work as a result of a work-related injury or illness is identified and reported to the local safety advisor
- ensure reports involving their staff or activities under their control are investigated as appropriate and report forms completed
- agree any actions necessary to prevent recurrence with relevant staff and the safety advisor
- ensure actions to prevent recurrence agreed in reports are assigned, reviewed and completed according to any agreed timelines
- notify safety advisor and other responsible persons of reportable accidents

Safety Advisors must:

- understand the reporting regulations and have a working knowledge of any other regulations which apply to the activities being carried out (having access to other competent persons with this knowledge is an acceptable alternative)
- advise on, monitor and encourage reporting of relevant events
- review all reports made on the local reporting system and ensure progress is made on their investigation
- become involved in investigations as appropriate, either as part of a team for more serious events or help managers' investigations, comment on managers' investigations and make their own contribution to investigations
- agree actions and sign off or close out all reports
- in conjunction with managers, identify all events that are reportable to the enforcing authorities as soon as possible after they have occurred and ensure they are reported to the relevant authorities within the requisite time periods
- report serious and reportable events to Corporate Health & Safety as soon as possible after they have been identified
- maintain statistics on all reports, classifying them according to the NERC system and reporting them locally at regular intervals eg at safety committees and as part of annual reviews
- send quarterly and annual statistics to Corporate Health & Safety in a timely manner
- act as an expert and provide information and guidance on investigations

Staff:

- must make reports on events as identified in this procedure, entering onto the local accident reporting system details of any work related accidents, ill health, incidents or near misses which affected them or in which they are involved or observed (unless they know someone else has done this or, if they are incapacitated, when a colleague or manager must make the entry)
- must inform their line or other appropriate manager or the local safety advisor as soon as possible if absent from work or incapacitated by a work related injury or illness
- must participate in and co-operate with investigations into events in which they have been involved or may provide pertinent information

MANAGEMENT, MONITORING AND AUDITING

Management:

Good work related accident, ill health, incident or near miss reporting and investigation requires:

- openness / clear lines of communications between all levels of staff with no fear of blame
- an awareness of the importance of recording accidents, incidents or near misses
- competence and diligence in carrying out and reporting on investigations

Monitoring:

The monitoring of work related accident, ill health, incident or near miss reporting and investigation requires:

- review of the accident records weekly
- managers to ensure that their staff report all accidents, incidents or near misses in the accident reports
- reviewing statistics to look for trends.

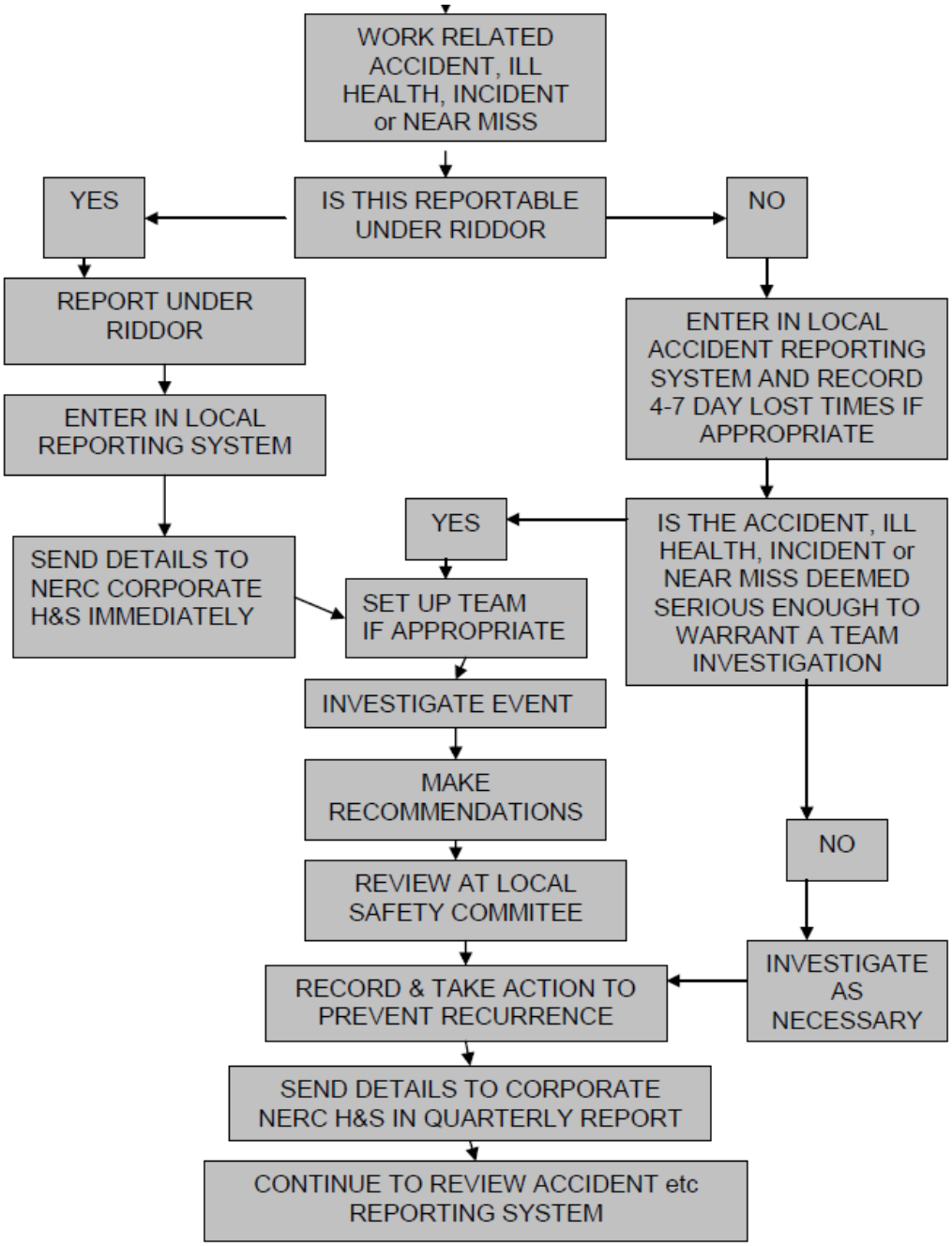
Auditing:

The auditing of accident reporting and investigation requires:

- checking that staff are complying with this procedure
- assessing management and staff attitudes by interview.

SYSTEM DIAGRAM

Work Related Accident, Ill Health, Incident and Near Miss Reporting and Investigation



WHAT MIGHT GO WRONG? – PROBABLE SOURCES OF SYSTEM AND INDIVIDUAL FAILURE

Management:

Failure to record work related accident, ill health, incident or near miss: if a work related accident, ill health, incident or near miss is serious or has long term consequences then there is a danger the event will be repeated. In addition there may be criminal prosecutions as if an accident is not recorded it cannot be reported. Also, if events are not recorded any civil proceedings when staff may decide to sue NERC for compensation will be more difficult for NERC to defend. **Remedy** – Encourage accident/incident near miss reporting and follow this procedure.

Failure to notify HSE of a reportable accident: HSE can prosecute NERC or an individual for failing to notify them of a reportable accident within the required time period. **Remedy –** encourage managers to inform site administrative staff of all serious work related accidents, ill health, incidents and near misses so that they can notify HSE without delay if it is reportable.

Failure to carry out an investigation of a serious accident, incident or near miss as soon as possible after they occur: this will also make it more difficult for NERC to collect evidence and establish true causes. This may make it impossible to refute a claim for compensation but will also mean that lessons cannot be learnt and the event may recur with more serious consequences. **Remedy –** the weekly check of the accident reports should show up any serious accidents, incidents or near misses which have not already been notified.

MAKE SURE THE MESSAGE IS CONVINCING, CONSISTENT AND ENFORCED

Staff:

Failure to record a work related accident, ill health, incident or near miss in the local accident reporting system: It is important for staff to record accidents, ill health, incidents and near misses in to the local accident reporting system. If they fail to do so, there is no opportunity for lessons to be learnt that could prevent future recurrences, which may have even more serious consequences. This is one of the main means by which NERC can improve its safety performance. If someone is injured and later wishes to seek compensation, they may find it more difficult to substantiate their claim. **Remedy –** report a work related accident, ill health, incident or near miss as soon possible after it happens or becomes apparent. If you are away from base on fieldwork or other business, make a note of what happened and report it to the local accident reporting system as soon as you return to base. If the work related accident, ill health, incident or near miss is serious, contact base and ask your manager to make an entry on your behalf.

REFERENCES

1. Reporting of Injuries Diseases and Dangerous Occurrences Regulations 2013
2. Merchant Shipping (Accident Reporting and Investigation) Regulations 2012
3. The Civil Aviation (Investigation of Accidents and Incidents) Regulations 1996
4. Civil Aviation Authority Mandatory Occurrences Reporting Scheme
5. HSE BI 510 Accident Book, 2003, ISBN 9780717626038
6. HSE leaflet 'Reporting Accidents and Incidents at Work', INDG453(rev)
7. HSE Guidance Booklet HSG48, 'Reducing error and influencing behaviour', 2nd Edition, Reprinted 2007, ISBN 978 0 7176 2452 2,
8. Groeneweg, J. & Roggeveen, V. (1998), 'Tripod: Controlling the human error components in accidents', in 'Safety and Reliability', eds Lydersen, Hansen & Sandtorv, pp. 809-816
9. IOSH Guide, 'Learning the lessons: how to respond to deaths at work and other serious incidents', Revised 2015 (can be downloaded from the IOSH books and resources webpage here).
10. NERC Business Continuity Framework Document (formerly 'Capstone')
11. HSE Guidance Booklet HSG245 'Investigating Accidents and Incidents: A workbook for employers, unions, safety representatives and safety professionals', 2014 ISBN
12. Energy Institute: 'Learning from Incidents, Accidents and Events', 1st Edition 2016 ISBN 978 0 85293 9 (may be downloaded from the Energy Institute publications webpage once registered)
13. The Noordwijk Risk Initiative Foundation: 'ECFA+ - Events and Conditional Factors Analysis Manual', 2nd Edition 2014

APPENDIX I: THE REPORTING OF INJURIES, DISEASES & DANGEROUS OCCURRENCES REGULATIONS 2013 - Summary

Notes for the manager

When do I need to take action?

Death or specified injury

If there is an accident arising out of or in connection with a work activity and:

- a NERC/collaborative centre employee or a self employed person working on your premises is killed or suffers a specified injury (including as a result of physical violence) or a person who is not at work eg a student, visitor or member of the public is killed or taken directly to hospital for treatment of an injury suffered or

the responsible person (normally the employer) must:

- inform the enforcing authority without delay by the quickest practicable means, usually by telephone. They will ask for brief details about your business, the injured person and the accident;
- follow this up with a completed accident report form via the HSE website electronic reporting system within ten days.

The enforcing authority is usually the HSE. The name, address and phone number of the enforcing authority should be shown on the poster entitled "Health and safety law: what you should know" which must be clearly displayed at every site.

Notification to the enforcing authority will only normally be done by the safety advisor. Managers or other persons involved in serious occurrences that might include fatalities, specified injuries should inform their local safety advisor as soon as possible so it can be checked whether or not they need reporting and, if they do, the enforcing authority may be contacted with the necessary information within the prescribed period. Only in extreme circumstances when no safety advisor is available and Corporate Health and Safety are uncontactable should a senior manager directly contact the enforcing authority.

A specified injury can include any of the following

- Fracture other than to fingers, thumbs or toes
- Amputation of an arm, hand, finger, thumb, leg, foot or toe
- Permanent loss or reduction of sight
- Crush injuries leading to internal organ damage
- Serious burns (covering more than 10% of the body or damaging the eye, respiratory system or other vital organs)
- Scalpings (separation of skin from the head) which require hospital; treatment
- Unconsciousness caused by head injury or asphyxia
- Any other injury arising from working in an enclosed space, which leads to hypothermia, heat induced illness or requires resuscitation or admittance to hospital for more than 24 hrs.

Further information is at the HSE RIDDOR Specified Injury webpage

Dangerous occurrences

If a reportable dangerous occurrence has happened, the enforcing authority without delay by the quickest practicable means. Although the telephone would normally be considered to be the quickest available means, the HSE guidance is now that electronic reporting of a dangerous occurrence via HSE website electronic reporting system is all that is required. However, this should be done as soon as possible after the facts become known and not delayed unduly. Notification to the enforcing authority will only normally only be done by the safety advisor.

There are 27 defined dangerous occurrence categories and further information can be found on the HSE RIDDOR Dangerous Occurrences webpage.

Reportable Diseases

The following occupational diseases, which must be diagnosed by a doctor, are reportable

- **Carpal Tunnel Syndrome**: where the person's work involves regular use of percussive or vibrating tools
- **Cramp of the hand or forearm**: where the person's work involves prolonged periods of repetitive movement of the fingers, hand or arm
- **Occupational dermatitis**: where the person's work involves significant or regular exposure to a known skin sensitiser or irritant
- **Hand Arm Vibration Syndrome**: where the person's work involves regular use of percussive or vibrating tools, or holding materials subject to percussive processes, or processes causing vibration
- **Occupational asthma**: where the person's work involves significant or regular exposure to a known respiratory sensitiser
- **Tendonitis or tenosynovitis**: in the hand or forearm, where the person's work is physically demanding and involves frequent, repetitive movements

Over seven-day lost time injuries

It is important to have systems in place to identify and report to the local safety advisor any lost time injuries arising out of or in connection with a work related activity that consequently lead to time off work (other than on the day of the accident) or incapacitation from work that they would be expected to do as part of their normal work. This means managers must ensure that when they are contacted by their staff reporting their absence from work, it is established if the reason for absence is as a result of an injury received in a work-related accident. Also, every manager should check that, when someone who has been absent from work returns, the absence is not related to a work related injury or condition.

The reason for identifying work related lost time injuries is to enable the local safety advisor to keep a record of all work related injuries resulting in more than three days off work.

A specific record must be kept of accidents leading to between 4 and 7 incapacitation for work and the local safety advisor informed but they do not need to be reported to the HSE.

If a person is off work, or incapactitated from undertaking their normal work, for more than seven days, the enforcing authority must be notified. The deadline by which the over seven-day injury must be reported is fifteen days from the day of the accident. Notification to the enforcing authority will only normally only be done by the safety advisor.

Further information can be found at the HSE RIDDOR Reportable Incidents webpage.

It should be noted that injuries which do not arise out of or in connection with the work activity do not need to be reported. Examples would be injuries arising from recreational activities such as sport which are not part of the paid employment.

APPENDIX II: STEPS TO BE FOLLOWED IN INVESTIGATING ACCIDENTS AND INCIDENTS (taken from HSG 245)

STEP 1 – GATHERING THE INFORMATION

Where, when and who?

1. Where and when did the adverse event happen?
2. Who was injured/suffered ill health or was otherwise involved with the adverse event?

How and What?

3. How did the adverse event happen? (note any equipment involved)
4. What activities were being carried out at the time?
5. Was there anything unusual or different about the working conditions?
6. Were there adequate safe working procedures and were they followed?
7. What injuries or ill effects, if any, were caused?
8. If there was an injury, how did it occur and what caused it?
9. Was the risk known? If so, why wasn't it controlled? If not, why not?
10. Did the organisation and arrangement of the work influence the adverse event?
11. Was maintenance and cleaning sufficient?
12. Were the people involved competent and suitable?
13. Did the workplace layout influence the adverse event?
14. Did the nature or shape of the materials influence the adverse event?
15. Did difficulties using the plant and equipment influence the adverse event?
16. Was the safety equipment sufficient?
17. Did other conditions influence the adverse event?

STEP 2 – ANALYSING THE INFORMATION

18. What were the immediate and underlying / root causes?

There are many different methods of analysing the information gathered in an investigation to find the immediate, underlying and root causes. Normally simple intuitive investigation methods are sufficient but if more detailed analysis is required, '5 Whys' is one useful additional method (see Appendix VI). If human factors are considered to be involved, then Performing Influencing Factors can be used as a checklist to identify relevant issues (see Appendix V) or Basic Risk Factors (see Appendix IV) used.

What happened and why?

If human factors are identified as a contributory factor? (Individual / job / organisation / plant and equipment – see Appendix IV). Can also use a checklist (see Appendix V)

STEP 3 - IDENTIFYING SUITABLE CONTROL MEASURES

19. What risk control measures are needed / recommended?
20. Do similar risks exist elsewhere? If so, what and where?
21. Have similar adverse events happened before?

STEP 4 – THE ACTION PLAN AND ITS IMPLEMENTATION

22. Which risk control measures should be implemented in the short and long term? (establish a risk control plan)
23. Which risk assessments and safe working procedures need to be reviewed and updated?
24. Have the details of the adverse event and the investigation findings been recorded and analysed? Are there any trends or common causes which suggest the need for further investigation? What did the adverse event cost?

APPENDIX III: Suggested headings for Accident or Work Related Ill Health and Incident or Near Miss Recording incorporating NERC classification

NERC ACCIDENT or WORK RELATED ILL HEALTH REPORTING

Date and time of occurrence:

Location of occurrence:

Full name(s) of injured person(s):

Name of person reporting:

Status (eg employee, self-employed, student, contractor, visitor, member of public):

Name of employer if not NERC:

Department:

Job title:

Name of line manager:

Name(s) of witnesses:

Type of Accident (selected from this list)

Contact with moving machinery or materials being machined
Hit by a moving, flying or falling object
Injury involving a moving vehicle (other than RTA)
Collided with something fixed or stationary
Injured while lifting or handling
Repetitive strain injury (including upper limb disorder from DSE use)
Slipped, tripped or fell on same level
Fell from a height
Trapped by something collapsing
Drowned or asphyxiated
Exposed to, or in contact with harmful chemical agent
Exposed to, or in contact with harmful biological agent
Exposed to or in contact with, hot or cold
Exposed to ionising radiation
Exposed to non-ionising radiation
Exposed to fire
Exposed to an explosion
Contact with electricity or an electrical discharge
Injured by an animal
Physically assaulted by a person
Cut or stabbed with a sharp object
Injured by a hand tool
Involved in road traffic accident
Work related illness (other than repetitive strain)
Other kind of accident

Type of Work Related Ill health (selected from this list)

Conditions due to physical agents and demands of work

1. Physical

2. Musculoskeletal incl. repetitive strain injury and upper limb disorders
3. Mental ill health incl. stress

Infections related to work exposure (eg from lab / field work or overseas working)

4. Occupationally acquired infections

Conditions due to exposure to substances used at work

5. Dermal
6. Respiratory
7. Sensitisation
8. Systemic
9. Cancer
10. Reproductive

Other work related ill health conditions not classified into above categories

11. Others

Type of Injury (selected from this list)

Amputation
Bruising or swelling
Burn or scald (including cold burn and frostbite)
Concussion
Crushing
Dislocation
Foreign body (eg splinter)
Fractured bone
Gassing or poisoning
Infection
Insect bite
Irritation or allergy
Laceration or cut
Loss of consciousness
Multiple injuries
Minor, abrasion / contusion
Shock
Strain or sprain including actual/potential musculo-skeletal disorders
Other

Location of injury (selected from this list)

Arm*
Ankle*
Back (including spine)
Buttock(s)*
Eye(s)*
Finger(s) including thumb*
Foot*
Hand*
Head (including nose, mouth and ears)
Internal
Leg*
Multiple
Neck
Toe(s)*
Trunk (other than back)
Wrist*
**specify right, left, both or which finger or toe as applicable*

First Aid Treatment received:

Whether it was considered work related or not (eg recreational is not work related):

Nature of any further action eg sent home, referred to GP, sent for x-ray, sent to hospital for further checks, retained in hospital etc.:

Next day off work as a result of accident/ill health?

Calendar days unfit for work (incl. weekends and holidays):

If not yet returned to work, days off at date of report:

(NOTE: If injured person is unfit for work as a result of the accident/illness for more than 3 calendar days inform your Safety Advisor immediately)

Description of what happened (who, what, where, why, when and how), including possible immediate and underlying causes:

Comments of / investigation by line manager or other responsible person (eg base commander):

Comments of / investigation by senior manager (if appropriate):

Comments of / investigation by Health and Safety Advisor (or other appropriate person such as RPS, Occupational Health Professional, Environment Advisor or Security Co-ordinator):

Remedial action agreed:

Action by:

Date action required by or review date:

Reportable to HSE or other enforcing authority

If reportable, date reported and enforcing authority reported to (eg HSE, LA, EA, MAIB, CAA, AAIB):

If outside UK, would it have been RIDDOR reportable if it had occurred in UK?

NERC INCIDENT or NEAR MISS REPORTING

Date and time of occurrence:

Location of occurrence:

Name of person reporting:

Name(s) of other person(s) involved:

Status (eg employee, self-employed, student, contractor, visitor, member of public):

Name of employer if not NERC:

Department:

Job title:

Name of responsible line manager:

Name(s) of witnesses:

Type of Incident (selected from this list)

Use of equipment, including failure, overturning or defect
Moving, flying or falling object
Use of road vehicles and other land based transport
Use of ships or boats
Use of aircraft
Collision/contact with static object
Ergonomic including manual handling and DSE
Fall or potential for a fall or slip
Workplace or working environment condition or fault
Work in water including diving
Unsafe or potentially unsafe atmosphere
Work involving biohazards, including unplanned releases
Work involving chemicals, including unplanned releases
Work involving disposal of materials or waste
Fire or potential for a fire
Work involving electricity
Explosion or potential for explosion
Work involving animals
Work involving ionising radiation
Work involving non-ionising radiation
Work involving sharps
Work involving extremes of temperature
Potential for violence or assault
Actual or potential environmental damage
Loss or potential loss of security
Dangerous Goods
Other type of incident or near miss

Damage or potential damage:

Description of what happened (who, what, where, why, when and how), including possible immediate and underlying causes:

Description of further action taken at time:

Comments of / investigation by line manager or other responsible person (eg base commander):

Comments of / investigation by senior manager (if appropriate):

Comments of / investigation by Health and Safety Advisor (or other appropriate person such as RPS, Occupational Health Professional, Environment Advisor or Security Co-ordinator):

Remedial action agreed:

Action to be taken by:

Date action required by:

Review date:

Reportable to HSE or other enforcing authority?

If reportable, date reported and enforcing authority reported to (eg HSE, LA, EA, MAIB, CAA, AAIB):

If outside UK, would it have been RIDDOR reportable if it had occurred in UK?

APPENDIX IV: HUMAN FACTORS IN ACCIDENT INVESTIGATION

The Health and Safety Executive defines 'Human Factors' as "Environmental, organisational and job factors and individual characteristics which influence behaviour at work in a way which can affect health and safety". HSG48 – Reducing error and influencing behaviour. The three basic elements to consider are the organisation, the job and the individual and how they impact on peoples' behaviour with regard to health and safety.

The Organisation – Organisational factors will very often be very influential on behaviour. The safety culture of an organisation must be positive and encourage employee involvement and commitment at all levels.

The Job – Matching the job to the person both in terms of physically matching and mentally matching will reduce the potential for human error.

The Individual – Individuals bring their own skills and attitudes and these can have both positive and negative results. Skills and attitudes can be changed and improved to some degree although it must be recognised some characteristics of personality cannot be changed.

These human factors have been amplified in the 'Performance Influencing Factors which are given in Appendix V.

When investigating accidents, incidents and near misses involving human factors or failures it will be important to bear in mind that there will often be contributing factors that are remote in time and space from the accident, incident or near miss. Preventing a re-occurrence of an accident, incident or near miss may mean that changes are required in a number of areas such as:

- training and supervision
- work design
- procedures and equipment design
- staff resources
- work planning and organisation

Alternative human factor investigation methods which may be considered are: HPIP – Human Performance Investigation Process; HFIT – Human Factors Incident Investigation Tool and MORT – Management Oversight and Risk Tree.

BASIC RISK FACTORS

An alternative approach to reviewing human factors in accident investigation is that of 'Basic Risk Factors'* (also known as latent causes). This approach highlights the following factors that need to be questioned / reviewed during the investigation to identify any possible preconditions or latent failures (shortcomings in the precautions, breaches in the defences) that existed in the organisational environment and may have contributed to the accident's occurrence (all but the last may be considered human error factors and are termed 'prevention factors' with the last a 'mitigation factor'):

- Design
- Tools and equipment ('hardware')
- Maintenance
- Housekeeping
- Error enforcing conditions (situations or environments which encourage poor working)
- Procedures
- Training
- Communication
- Incompatible goals
- Organisation
- Defences (protection against consequences of adverse events)

*Taken from Groeneweg and Roggeveen 1998

APPENDIX V: PERFORMANCE INFLUENCING FACTORS

Adapted from the HSE Human factors topics

Performance Influencing Factors (PIFs) are the characteristics of the job, the individual and the organisation that influence human performance. Optimising PIFs will reduce the likelihood of all types of human failure. *NB. This list is not exhaustive*

Job Factors
• Clarity of signs, signals, instructions and other information • System / equipment interface (labelling, alarms, error avoidance / tolerance) • Difficulty / complexity of task • Routine or unusual task • Divided attention • Procedures inadequate or inappropriate or unavailable • Preparation for task *e.g. permits, risk assessments, checking) • Time available / required • Tools appropriate for task • Communication: with colleagues, supervision, contractor, other • Communication: clarity, verbal, face to face / remote, alarms, handovers etc. • Working environment (noise, heat, space, lighting, ventilation)
Person ('Individual') Factors
• Physical capability and condition • Fatigue (acute from temporary situation or chronic / systemic) • Stress / morale • Work overload / underload (boredom) • Competence to deal with circumstances • Motivation vs. other priorities • Influenced by medication, alcohol or recreational drugs
Organisation Factors
• Work pressures e.g. production vs. safety • Level and nature of supervision / leadership • Communication • Staffing levels • Peer pressure • Clarity of roles and responsibilities • Consequences of failure to adhere to rules / procedures • Effectiveness of organisational learning (learning from experiences) • Organisational or safety culture e.g. 'no-one follows the rules' • Change management • Competence assurance for: routine tasks, safety critical; tasks, contractors • Management and supervision of contractors in specialist / core / short term work.

Performance Influencing Factors (PIFs) can be described as factors which allow the propensity for humans to make errors in creating situations in which those human errors become more likely to occur. PIFs do not of their own create human error but, if the wrong PIF is present, make it more likely to occur. PIFs are related to quality / detail of procedures, time pressures, suitability and quality of training and will be on a spectrum from poor to excellent. If the relevant PIFs are optimal then performance should also be optimal and so the likelihood of error will be at a minimum.

APPENDIX VI: '5 Whys' method to determine underlying or root causes

(Adapted from an article on the 5 Whys)

5 Whys is an iterative interrogative technique used to explore the cause-and-effect relationships underlying a particular problem.[1] The primary goal of the technique is to determine the root cause of a defect or problem by repeating the question "Why?" Each answer forms the basis of the next question. The "5" in the name derives from an anecdotal observation on the number of iterations needed to resolve the problem.

The technique was used within the Toyota Motor Corporation during the evolution of its manufacturing methodologies. In other companies, it appears in other forms. Some practice "three whys" and broaden the practice to cover goal setting and decision making.

Not all problems have a single root cause. If one wishes to uncover multiple root causes, the method must be repeated asking a different sequence of questions each time.

The method provides no hard and fast rules about what lines of questions to explore, or how long to continue the search for additional root causes. Thus, even when the method is closely followed, the outcome still depends upon the knowledge and persistence of the people involved.

Example

Problem: *The vehicle will not start.*

1. ***Why?*** - The battery is dead. (first why)
2. ***Why?*** - The alternator is not functioning. (second why)
3. ***Why?*** - The alternator belt has broken. (third why)
4. ***Why?*** - The alternator belt was well beyond its useful service life and not replaced. (fourth why)
5. ***Why?*** - The vehicle was not maintained according to the recommended service schedule. (fifth why, a root cause)

The questioning for this example could be taken further to a sixth, seventh, or higher level, but five iterations of asking why is generally sufficient to get to a root cause.

The key is to encourage the trouble-shooter to avoid assumptions and logic traps and instead trace the chain of causality in direct increments from the effect through any layers of abstraction to a root cause that still has some connection to the original problem. Note that, in this example, the fifth why suggests a broken process or an alterable behaviour, which is indicative of reaching the root-cause level.

It is interesting to note that the last answer points to a process. This is one of the most important aspects in the 5 Why approach - the *real* root cause should point toward a process that is not working well or does not exist. Untrained facilitators will often observe that answers seem to point towards classical answers such as not enough time, not enough investments, or not enough manpower. These answers may be true, but they are out of our control. Therefore, instead of asking the question **why?**, ask **why did the process fail?**

A key phrase to keep in mind in any 5 Why exercise is "people do not fail, processes do".

Technique

Two primary techniques are used to perform a 5 Whys analysis:

- the fishbone diagram
- a tabular format

These tools allow for analysis to be branched in order to provide multiple root causes.

Rules of performing 5 Whys

In order to carry out the 5-Why analysis properly, the following advice should be followed:

1. It is necessary to engage the management in 5Whys standard in the company. For the analysis itself, remember about right working group. Also consider facilitator presence for more difficult topics.
2. Let's use paper or whiteboard instead of computers.
3. Let's write down the problem and make sure that all people understand it.
4. Let's distinguish causes from symptoms.
5. Let's take care of the logic of cause-and-effect relationship.
6. Let's make sure that root causes certainly lead to the mistake by reversing the sentences created as a result of the analysis with the use of expression "and therefore".
7. Let's try to make our answers more precise.
8. Let's look for the cause step by step. Don't jump to conclusions.
9. Let's base on facts and knowledge.
10. Let's assess the process, not people.
11. Never leave "human error", "worker's inattention", etc. as the root cause.
12. Let's take care of the atmosphere of trust and sincerity.
13. Let's ask the question "why" until the root cause is determined, i.e. such cause the elimination of which will cause that the error will not occur again.[7]

Weaknesses

While the 5 Whys is a powerful tool to help get to the true causes of problems, it has been criticised as being too basic to always analyse root causes to the depth that is needed. Reasons for this criticism include:

- Tendency for investigators to stop at symptoms rather than going on to lower-level root causes.
- Inability to go beyond the investigator's current knowledge - cannot find causes that they do not already know.
- Lack of support to help the investigator ask the right "why" questions.
- Results are not repeatable - different people using 5 Whys come up with different causes for the same problem.
- Tendency to isolate a single root cause, whereas each question could elicit many different root causes.

These can be significant problems when the method is applied through deduction only. On-the-spot verification of the answer to the current "why" question before proceeding to the next is recommended to avoid these issues. In addition, performing logical tests for necessity and sufficiency at each level can help avoid the selection of spurious causes and promote the consideration of multiple root causes.